Proposed Massachusetts Stretch Energy Code

Question and Answer (Q&A)

General Questions:

What changes to the building code are being proposed?

It is proposed that in addition to the baseline energy code for Massachusetts, that there be a more energy-efficient code option that cities and town could elect to adopt. This 'stretch code' option would increase the energy efficiency code requirements in any municipality that adopts it, for all building types covered by the stretch code.

What is the motivation for this change?

There have been mounting calls for additional stringency in the building energy code, linked to concerns about energy costs, climate change and national security. The last legislative session in Massachusetts saw an unprecedented number of bills put forward on energy and green building and led to the passage of the Green Communities Act, the Green Jobs Act, and the Global Warming Solutions Act.

Moreover, several towns and cities continue to lobby for a stronger state building energy code, and/or legislative changes to allow municipalities to strengthen their own codes.

Finally, the Executive Office of Energy and Environmental Affairs, the Department of Public Safety and the Department of Energy Resources all believe that it would be more efficient to develop one alternative 'stretch' code that is consistent across the state, to meet the demand for a stricter code, rather than having a plethora of competing code standards developed and implemented at the local level.

What are some of the expected benefits to a municipality of a more stringent energy code?

In addition to allowing municipalities to take meaningful action on energy use and climate change, the adoption of a more stringent energy code is anticipated to result in significant medium- and long-term cost savings for local residents and businesses, as well as increased design and construction firm competitiveness in the growing green building marketplace.

What is the anticipated cost of implementing a more stringent energy code?

Initial adoption of a higher performance standard for buildings is likely to result in higher first costs for construction. For residential, on average perhaps $8,000 per home. However, the goal of the program is to select and adopt standards that are based on demonstrated cost-effective energy improvements that minimize these additional first costs while providing a stream of energy cost savings. The required improvements have been chosen based on modeling which shows that when the added construction costs are rolled into a 30-year mortgage, the monthly energy bill savings will exceed the increase in the monthly mortgage payment.

What is the process for adoption of the stretch energy code?

If approved by the BBRS, the stretch code would be incorporated into the Massachusetts building code as an optional appendix. Towns and cities in Massachusetts would then be able to choose between remaining on the base energy code or adopting the stretch energy code as their mandatory energy code requirement. Interested municipalities could adopt the stretch code as part of their town meeting, city council meeting, by vote of their board of alderman, or their equivalent public meeting process at the municipal level. Once adopted the stretch code would then become a code requirement in that municipality.

Scope:

What buildings would the stretch energy code apply to?

The proposed stretch code would apply to:

i) Residential buildings from single family homes up to and including buildings of three stories or less with any number of units.

ii) Commercial buildings over 5,000 sq ft, including multi-family residential buildings over three stories, but excluding specialized facilities such as supermarkets, laboratories, and warehouses. Other building types with unusual energy usage profiles can also apply for a waiver from the stretch code from the Board of Building Regulations and Standards (BBRS).

Does the stretch code apply to major renovation projects as well as new construction?

The stretch energy code would also apply to residential building additions and renovations, but would require a lower threshold of energy performance than new buildings, due to general design and cost constraints in renovating an existing building. At this time there is not an equivalent program available for renovating commercial buildings, but this building stock may be addressed in future with amendments.

Does the stretch code apply to minor additions to existing buildings?

Small additions that are both less than 30% of the floor area and less than 600 sq ft in size will have to meet the stretch code, but don't require 3rd party verified performance rating. Instead they are required to follow the IECC 2009 code for climate zone 6A or the Energy Star National Builders Option Package, whichever is more stringent. This results in modest increases in insulation requirements over the requirements of the Massachusetts base code for small building addition projects.

What happens to buildings not covered by the stretch energy code?

Building types that do not fall under the stretch energy code scope, such as very small commercial buildings or specialized use buildings like laboratories, will remain under the existing base code and are encouraged to meet voluntary green building program standards.

Standards:

What standards are the proposed code changes based on?

The residential stretch code proposal is based on the existing 'Energy Star for Homes' and Residential Energy Services Network (RESNET) HERS ratings approach.

The commercial stretch code proposal for buildings from 5,000 sq ft to 100,000 sq ft is based on The *International Energy Conservation Code, 2009*, and the New Buildings Institute (NBI) *Core Performance*

Guide for commercial buildings. Commercial buildings above 100,000 sq ft are required to show a percentage improvement below *ASHRAE 90.1-2007* standards; this is also an option for smaller commercial buildings.

Enforcement/Requirements:

How would the stretch code be implemented and enforced?

Once the stretch energy code is adopted by a town or city, it replaces and supplements the base energy code language and becomes the energy code language for relevant buildings in that municipality. Implementation and enforcement of the code is similar to existing code enforcement and implementation. However, the residential performance testing parts of the stretch code require independent 3rd party certification of building construction performance.

What is the role of building code officials in a code that requires 3rd party verification?

Any construction projects falling under the stretch energy code would still require sign-off from local code inspectors. However, the project oversight and verification of residential energy measures would in most cases be provided by a 3rd party. A 3rd party report would be submitted to the local building inspector for his/her review prior to the issuance of a certificate of occupancy. In this way the local inspectors retain their oversight role but the additional energy requirements would not place a significant additional burden on their time.

Residential Building Questions:

What is the rating system proposed for use by the residential stretch code?

The residential stretch code proposal is based on adoption of the nationally successful 'Energy Star for Homes' program requirements. The Energy Star for Homes program evaluates home energy efficiency based on the HERS Index, which is also a national standard developed by the non-profit RESNET for the mortgage industry, and utilized by the Federal Internal Revenue Service (IRS) and the Leadership in Energy and Environmental Design (LEED) for Homes residential program.

What is required to meet the residential stretch code?

The residential stretch code proposal would require all residential buildings up to and including three stories to meet the Energy Star requirements, including the Energy Star thermal bypass checklist, and in addition to be verified as meeting a HERS index rating of 60 or less by a certified 3rd party HERS rater. This certification would be a required submission to the local code inspector prior to a project being issued a certificate of occupancy.

How is the MA stretch code different from the existing Energy Star for Homes program?

The Energy Star for Homes program is a voluntary program for home builders with over 250 builders enrolled. The stretch code makes the Energy Star program requirements mandatory in any adopting municipality and requires a HERS index rating of 60 or less, which is slightly more stringent than the current Energy Star tier 2 requirement of a HERS Index of 65 or less.

Cost-Benefit Analysis:

What cost-benefit analysis is being done to assess the cost-effectiveness of a stretch code?

Extensive cost-benefit analysis has been undertaken to develop the energy star for homes program that the residential stretch code is based upon. In addition, to help select the appropriate initial target for the stretch code the state has commissioned additional detailed cost analysis. Findings show that this stretch code will likely provide significant economic benefits to homeowners and tenants of stretch code homes in Massachusetts, with net savings from the 1st year onwards due to lower utility bills offsetting incremental construction costs.

What assumptions have been used to project the initial costs and positive cash flow for a target HERS rating?

Data from homes that have received HERS ratings under the Energy Star for Homes program in MA in the past two years have been analyzed. The number of homes achieving ratings in the 50-60 range has grown significantly. In addition, homes using typical construction types were used to illustrate and model the measures likely to be used to meet these scores. So, builders and other stakeholders are able to judge for themselves the level of energy efficiency improvements typically required in residential construction. The modeled examples are limited to single family new construction, as this is the primary area of development, but there are also many examples of Energy Star-rated multi-family projects built recently in Massachusetts.

A 3rd party was contracted to assess the costs and benefits of energy improvements in a typical residential house, in order to determine which HERS ratings allow for net savings on an annual basis for a new homeowner when additional upfront construction costs are weighed against annual expected energy savings.

HERS Rating Questions:

Are there enough HERS raters in all areas of Massachusetts? Are there likely to be areas with either an abundance of HERS raters or not enough of them for the expected building permit activity?

Due to the existing Energy Star for Homes, and other programs, there are already a significant number of HERS raters in Massachusetts and other north east states, and plenty of surplus rating capacity relative to the current demand for HERS raters. The regional RESNET office is working to ensure that there is no potential shortage of HERS raters in any part of the State, as this code is implemented and adopted by municipalities.

What process and timeframe is needed to become a certified 'HERS rater' and who or what entity controls such certification process?

HERS raters are certified by RESNET, a national non-profit that was established in 1995. HERS raters are required to complete an intensive training course of 1 to 2 weeks, pass appropriate test s, and then participate in at least 5 ratings with an existing certified HERS rater before they are qualified to do ratings independently. Individual HERS raters are also affiliated with a RESNET affiliated company or cooperative that ensures that the raters are up-to-date on their energy-efficiency knowledge and training and to provide appropriate insurance coverage.

What are the "cradle-to-grave" costs to have a new building HERS rated? *(Building design, actual construction, as-built completion and blower door and duct blaster testing is involved in a comprehensive HERS rating process.)*

Estimated costs for HERS ratings currently range from $400 to $1000 per unit in Massachusetts. There are several companies providing this service and the price variation likely reflects differing levels of technical assistance to the builder, depending on their needs and preferences as well as the range of different construction project sizes and scopes.